

How Does Shock “Impact” Perseverance’s Selection of Samples for Return to Earth?

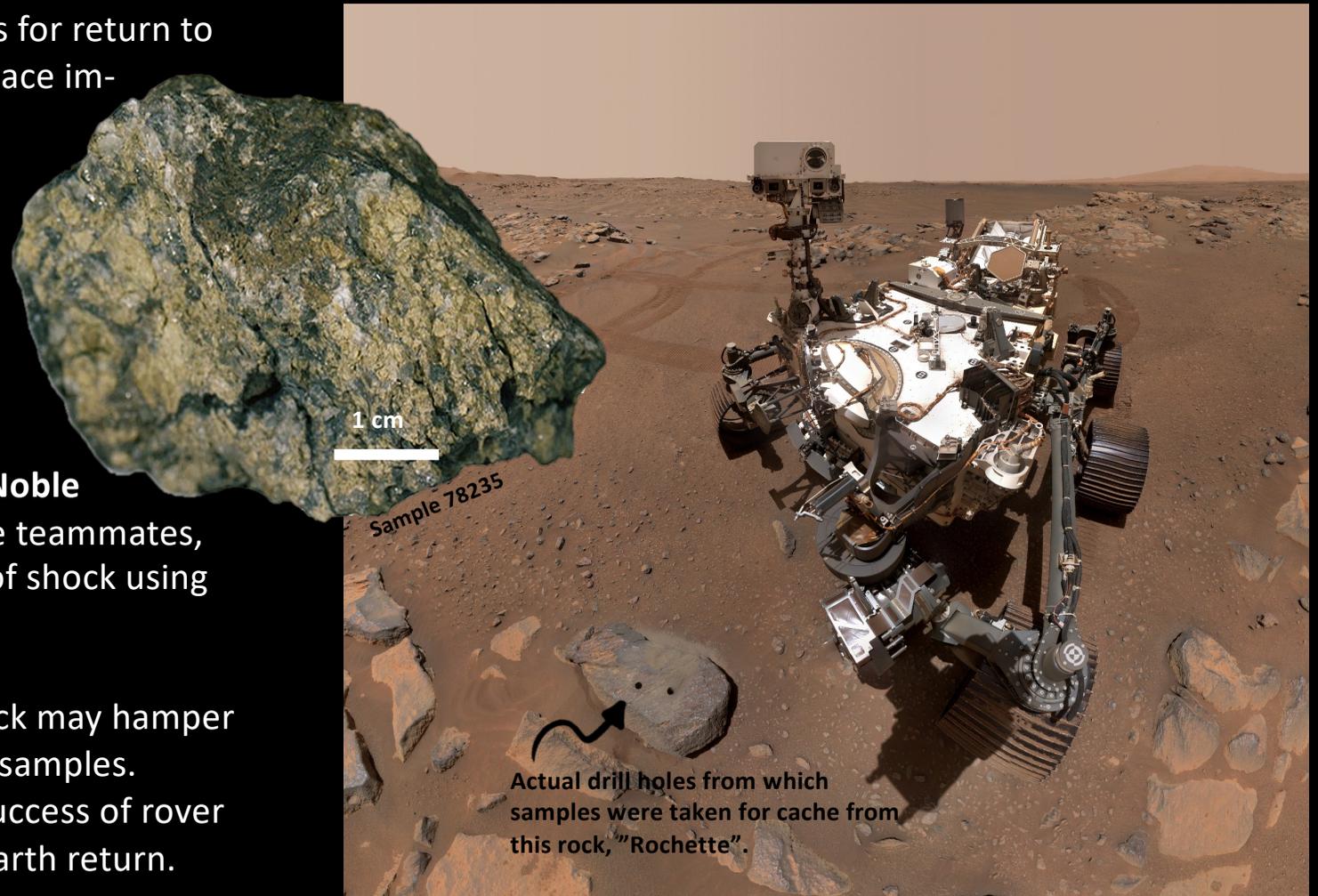
Perseverance is the first NASA rover to select samples for return to Earth. Collected samples, when returned, could (1) place important constraints on the timing of Martian geologic events when studied in terrestrial labs and (2) reveal traces of fossil life, if it existed on Mars.

The landing site, Jezero crater, shows abundant evidence of impact shock. Perseverance will likely be the first mission to encounter these kinds of materials.

Scientists in **NASA Goddard’s MNGRL (Mid-Atlantic Noble Gas Research Laboratory)**, with Perseverance science teammates, recognized the importance of identifying the extent of shock using spectroscopy techniques onboard the rover.

They found that rocks which experienced impact shock may hamper geochronology and astrobiology studies on returned samples. Recommendations were presented to enhance the success of rover analyses identifying minimally shocked samples for Earth return.

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Perseverance at the site of the first sample collection on Mars. Center: Lunar rock showing an example of a feldspar, like that studied in this work, with black melt veins indicating impact shock alteration.